

## CASE STUDY

# Residual gall bladder stone: A case series

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### ABSTRACT

**Background:** Subtotal cholecystectomy has been reported in 8% and 3.3% of patients undergoing open and laparoscopic cholecystectomy, respectively. According to a recent nationwide survey, the utilisation of subtotal cholecystectomy in the treatment of acute cholecystitis is on the rise. In 1.8% of subtotal cholecystectomies, a reoperation is required. Reoperations for residual gallbladder (GB), gallstones, and related complications accounted for half of the reoperations described in the literature after subtotal cholecystectomy. The purpose of this study was to evaluate the clinical profile, risk of complications, and feasibility of laparoscopic approaches and surgical procedures in patients with recurrent symptoms from a residual GB that necessitated a completion cholecystectomy. **Materials & Methods:** Patients who underwent surgery for residual GB with stones and/or complications between January 2017 and January 2023 were included in the study group. A prospectively maintained database was used to review patient information retrospectively. The demographic profile, operation details of the index surgery, current presentation, investigations performed, surgery details, morbidity and mortality were all included in the clinical information. **Results:** There were 13 patients who underwent completion cholecystectomy. The median age was 55 years (22-63 years). Prior operative notes mentioned subtotal cholecystectomy in only seven patients. The average time between the index surgery and the onset of symptoms was 30 months (2-175 months). A final diagnosis of residual GB with or without calculi was made by ultrasound (USG) in 11 patients and by magnetic resonance cholangiopancreatography (MRCP) in two others. Choledocholithiasis (n = 4, 30.7%), acute cholecystitis (n = 2, one with empyema and GB perforation) and Mirizzi syndrome (n = 1) were seen as complications of residual gallstones in seven patients. All 13 patients underwent successful laparoscopic procedures. A fifth port was used in all. A critical view of safety was achieved in 12 patients. Two patients required laparoscopic common bile duct (CBD) exploration for CBD stones. Intraoperative cholangiograms were done in eight patients (61.5%). There were no conversions, injuries to the bile duct or deaths. Morbidity was seen in one. The patient required therapeutic endoscopic retrograde cholangiography for cholangitis and CBD clearance on the fifth post-operative day. The median hospital stay was 4 days (3-7 days). At a median follow-up of 99 months, symptom resolution was seen in all 13 patients. **Conclusion:** Gallstones in the residual GB are associated with more complications than conventional gallstones. The diagnosis requires a high level of suspicion. MRCP is more accurate in establishing the diagnosis and identifying the associated complications, even if the diagnosis is made on USG in most patients. A pre-operative roadmap is provided by the MRCP. For patients with residual GB, laparoscopic completion cholecystectomy is a feasible and safe option.

**Keywords:** gallbladder stone, cholecystectomy, laparoscopic

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### INTRODUCTION

A residual gallbladder stone typically refers to a situation where after undergoing a procedure to remove gallstones, either through surgery (cholecystectomy) or non-surgical methods like lithotripsy, a small stone or stones are left behind in the gallbladder or bile ducts. These residual stones can cause similar symptoms to those experienced before the procedure, such as abdominal pain, nausea, and vomiting.<sup>1</sup>

It seems that there is relatively little chance of partial gallbladder removal with a traditional cholecystectomy.<sup>2</sup> The frequency of inadvertent incomplete gallbladder removal in the laparoscopic era is unclear, however it appears to be marginally

higher than that of open cholecystectomy reports. Up to 13.3% of laparoscopic cholecystectomies result in incomplete gallbladder excision.<sup>3,4</sup> A congenital duplication or an hourglass form caused by adenomyomatosis are examples of gallbladder morphology that might cause inadequate resection, as can adhesions, concomitant inflammation, severe bleeding, or poor vision of the gallbladder fossa during surgery. Identifying and treating retained calculi can be difficult. The majority of people who still have calculi need surgery.<sup>5,6</sup> The present study was conducted to record a case series of residual gall bladder stones.

**MATERIALS & METHODS**

The present study was conducted on 13 patients who underwent surgery for residual GB with stones and/or complications between January 2017 and January 2023 of both genders. All were informed regarding the study and their written consent was obtained.

Data such as the demographic profile, operation details of the index surgery, current presentation, investigations performed, surgery details, morbidity and mortality were all included in the clinical information. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

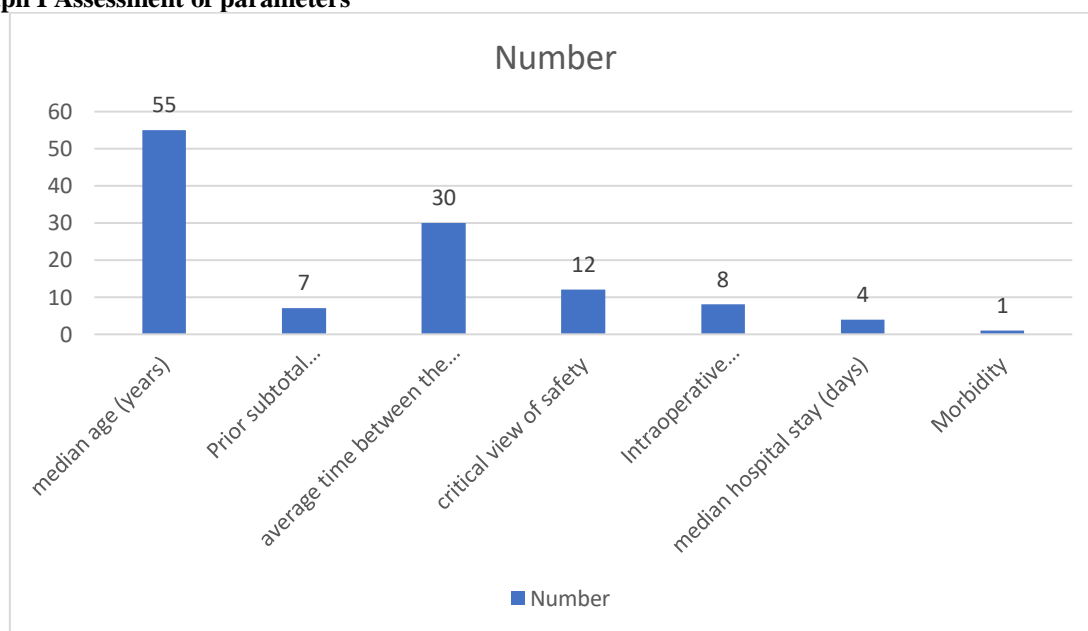
**Table I Assessment of parameters**

Parameters	Number
median age (years)	55
Prior subtotal cholecystectomy	7
average time between the index surgery and the onset of symptoms (months)	30
critical view of safety	12
Intraoperative cholangiograms	8
median hospital stay (days)	4
Morbidity	1

Table I, graph I shows that there were 13 patients who underwent completion cholecystectomy. The median age was 55 years (22-63 years). Prior operative notes mentioned subtotal cholecystectomy in only seven patients. The average time between the index surgery and the onset of symptoms was 30 months (2-175 months). A critical view of safety was achieved in 12

patients. Two patients required laparoscopic common bile duct (CBD) exploration for CBD stones. Intraoperative cholangiograms were done in eight patients (61.5%). There were no conversions, injuries to the bile duct or deaths. Morbidity was seen in one. The median hospital stay was 4 days (3-7 days).

**Graph I Assessment of parameters**



**Table II Diagnosis and complications**

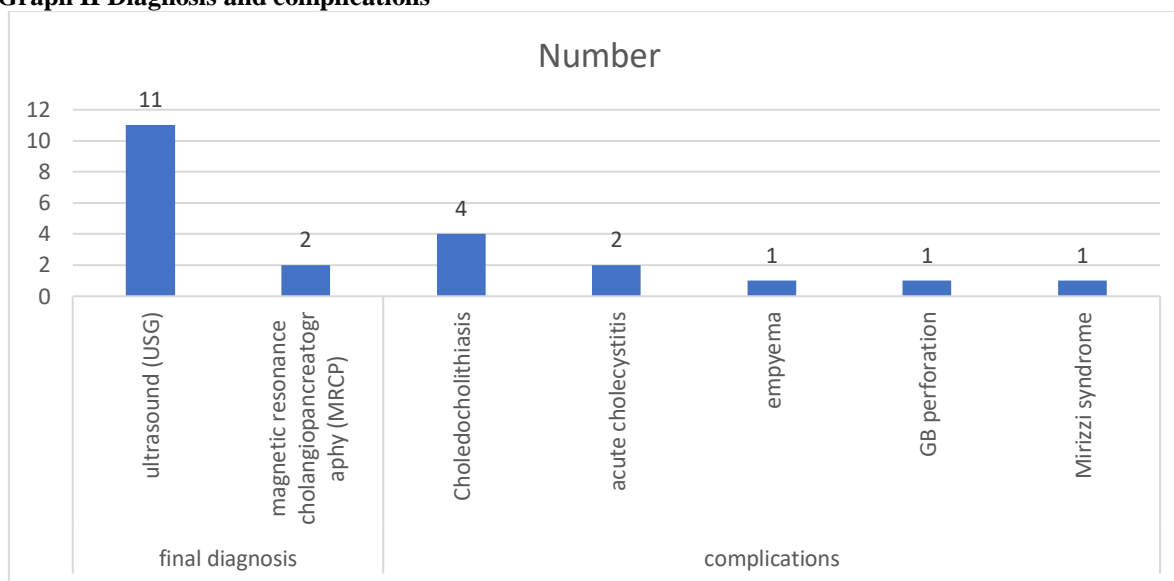
Parameters	Variables	Number	P value
final diagnosis	ultrasound (USG)	11	0.01
	magnetic resonance cholangiopancreatography (MRCP)	2	
complications	Choledocholithiasis	4	0.05
	acute cholecystitis	2	
	empyema	1	
	GB perforation	1	
	Mirizzi syndrome	1	

Table II, graph II shows a final diagnosis of residual GB with or without calculi was made by ultrasound (USG) in 11 patients and by magnetic resonance

cholangiopancreatography (MRCP) in two others. Choledocholithiasis (n = 4, 30.7%), acute cholecystitis (n = 2, one with empyema and GB

perforation) and Mirizzi syndrome (n = 1) were seen as complications of residual gallstones in seven patients. The difference was significant (P< 0.05).

**Graph II Diagnosis and complications**



## DISCUSSION

The term "residual gallbladder" (RGB) describes the portion of the gallbladder that is often still present after a partial cholecystectomy.<sup>7</sup> In cases where performing a full cholecystectomy is risky and difficult due to significant inflammation or portal hypertension, it may be done on purpose to avoid damaging vital structures.<sup>8</sup> In other cases, the RGB might have inadvertently been overlooked due to an incorrect diagnosis of the anatomy, typically when fibrosis and inflammation are present.<sup>9</sup> In certain people, a pathology such as a stone, inflammation, or fistula with other tissues may be present in the RGB or develop later and cause symptoms that need to be treated.<sup>10,11</sup> The present study was conducted to record a case series of residual gall bladder stones.

We found that there were 13 patients who underwent completion cholecystectomy. The median age was 55 years (22-63 years). Prior operative notes mentioned subtotal cholecystectomy in only seven patients. The average time between the index surgery and the onset of symptoms was 30 months (2-175 months). A critical view of safety was achieved in 12 patients. Two patients required laparoscopic common bile duct (CBD) exploration for CBD stones. Intraoperative cholangiograms were done in eight patients (61.5%). There were no conversions, injuries to the bile duct or deaths. Morbidity was seen in one. The median hospital stay was 4 days (3-7 days). Chowbey et al<sup>12</sup> found that in most series, primary diagnosis was established by ultrasound/computed tomography scan. Localization of calculi and delineation of biliary tract was performed using magnetic resonance imaging/magnetic resonance cholangiopancreatography and endoscopic retrograde cholangiopancreatography. In few series, diagnosis

was established by endoscopic ultrasound, intraoperative cholangiogram and percutaneous transhepatic cholangiography. Laparoscopic surgery, endoscopic techniques and open surgery were the most common treatment modalities. The most common sites of residual gallstones were gallbladder remnant, cystic duct remnant and common bile duct.

We observed that the patient required therapeutic endoscopic retrograde cholangiography for cholangitis and CBD clearance on the fifth post-operative day. At a median follow-up of 99 months, symptom resolution was seen in all 13 patients. Singh et al<sup>13</sup> in their study an examination done in hindsight on individuals treated for symptomatic RGB between January 2000 and December 2015. RGB was noted in 93 patients, 69 (74.2%) of whom were female and whose median age ranged from 25 to 70 years. Recurrence pain was the most prevalent presentation (n=64, 68.8%). In 23 individuals (24.7%), associated choledocholithiasis was detected. In contrast, magnetic resonance cholangio-pancreatography (MRCP) correctly diagnosed RGB calculi in all cases with the exception of two (4%) and also found common bile duct (CBD) stones in 12 patients. An ultrasonography (USG) was unable to diagnose RGB calculi in 10 (11%) of the patients. All patients underwent completion cholecystectomy (48.4% were open, 48.4% were laparoscopic, and 20.4% of patients needed to convert to open). In 90 cases (96.7%) with RGB pathology, stones and Mirizzi's syndrome were present. 90 patients (96.8%) had stones, 10 patients (10.8%) had Mirizzi's syndrome, and 9 individuals (9.7%) had an internal fistula as part of the RGB pathology. In addition, there were three Roux-en-Y hepatico-jejunostomies (n=3), four Choledochoduodenostomies (n=4), and six CBD explorations.

There was no death and 11% morbidity (all wound infection), respectively. During follow-up, incisional hernias occurred in two patients. 65 patients had an average follow-up of 23.1 months (3–108), and 97% of them had excellent or good results.

We observed that a final diagnosis of residual GB with or without calculi was made by ultrasound (USG) in 11 patients and by magnetic resonance cholangiopancreatography (MRCP) in two others. Choledocholithiasis (n = 4, 30.7%), acute cholecystitis (n = 2, one with empyema and GB perforation) and Mirizzi syndrome (n = 1) were seen as complications of residual gallstones in seven patients. All 13 patients underwent successful laparoscopic procedures. A fifth port was used in all. Daly et al<sup>14</sup> in their case report of 3 patients reported that in one patient ERCP showed a dilated cystic duct (6 mm) with a stone present at the junction of the cystic duct with the CBD but the CBD was normal. The stone was unable to be retrieved endoscopically after a sphincterotomy was performed.

The shortcoming of the study is small sample size.

## CONCLUSION

Authors found that gallstones in the residual GB are associated with more complications than conventional gallstones. The diagnosis requires a high level of suspicion. MRCP is more accurate in establishing the diagnosis and identifying the associated complications, even if the diagnosis is made on USG in most patients. A pre-operative roadmap is provided by the MRCP. For patients with residual GB, laparoscopic completion cholecystectomy is a feasible and safe option.

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